



5 **SOFTWARE-IMPLEMENTED TRANSFORM AND
LIGHTING MODULE AND PIPELINE FOR GRAPHICS
RENDERING ON EMBEDDED PLATFORMS USING A FIXED-POINT
NORMALIZED HOMOGENOUS COORDINATE SYSTEM**

ABSTRACT OF THE DISCLOSURE

10 A software-implemented transform and lighting module and pipeline
designed and optimized for embedded platforms (such as mobile computing
devices). The transform and lighting module and pipeline includes a number of
features that make it well-suited for use on embedded devices. These features
include a single streamline branched architecture that allows efficient processing
15 on a CPU of an embedded device and saves computational time. This
architecture is facilitated by use of a vertex cache that stores vertices as needed
to avoid duplication in processing of the vertices. A culling feature culls vertices
before lighting instead of lighting all vertices. A back face culling technique
examines each of the vertices to determines whether a back face of a triangle is
20 formed. If so, then the vertex is culled. A second technique involved determining
whether a vertex is outside of one view frustum clip plane. If so, then the vertex
is culled.

25